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FEBRUARY 1990

PRODUCTION

THE MAGAZINE OF MANUFACTURING MANAGEMENT

NETWORK 0006 Segment: 02

THE PLC: STILL A CONTENDER

IT 15: COUNTER #1 RESET

IT 14: COUNTER #2 RESET

IT 16: TOGGLING THIS BIT RELOADS THE CONFIG WORD

NMTBA Addresses World Quality

No More Aching Backs?

PRODUCTION Readers To Spend $10.7 Billion

COUNTER 2 RESET

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PRODUCTION

FEBRUARY 1990 THE MAGAZINE OF MANUFACTURING MANAGEMENT VOL. 102 NO. 2

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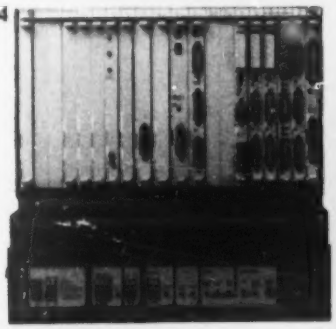

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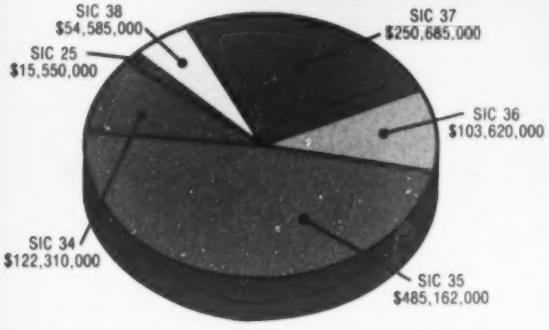

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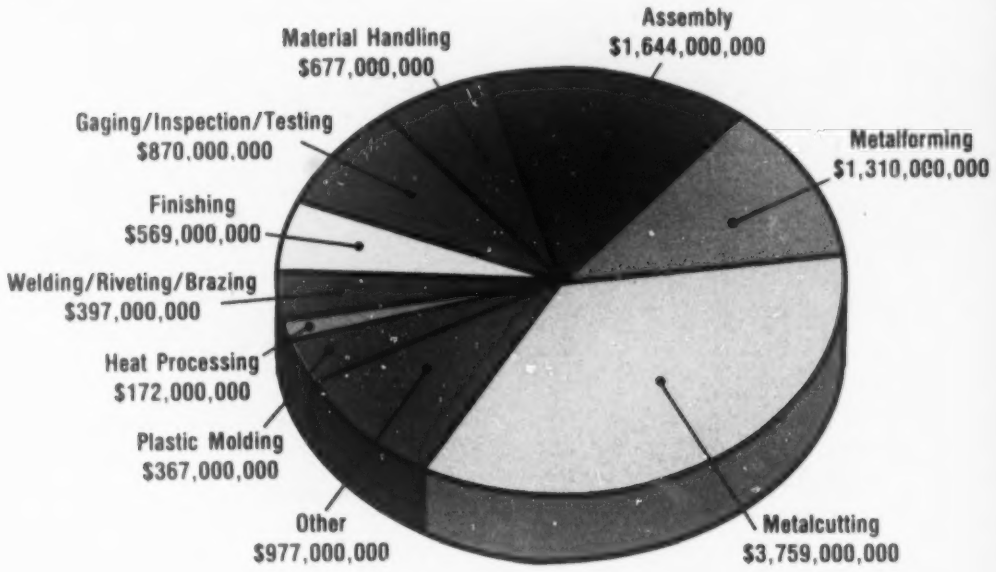
PRODUCTION

1990

Capital Spending:

Reader
Pocket
et Deep

1990 Capital Equipment Projected Expenditures



By Steven R. Kline
Publisher

You are a fairly optimistic group. Or maybe you look at the world through somewhat rose-colored glasses. At any rate, in response to PRODUCTION's 22nd Annual Capital Spending Survey* you painted a relatively bright picture for 1990. Despite some gloomy economic fore-

**This is PRODUCTION's 22nd Annual Capital Spending Survey. It was conducted by Edward D. McCallum, Jr. of McCallum & Associates. For more information, contact McCallum at: McCallum & Associates, 1100 North Woodward Ave., Suite 120, Birmingham, MI 48009. Telephone: 313-646-0630.*

Questionnaires were mailed to a universe of 10,000 plants on the PRODUCTION Magazine circulation list in the discrete parts manufacturing industries: SIC 34, Fabricated Metal Products; SIC 35, Machinery, except Electrical; SIC 36, Electrical Machinery; SIC 37, Transportation Equipment; SIC 38, Instruments; and a few selected companies in the Metal Furniture portion of SIC 25. The universe, by employment, is made up of every plant PRODUCTION Magazine reached employing 250 and over and every Nth plant reached employing less than 250 until a universe of 10,000 plants was assembled. We mail to upper echelon readers—presidents; executives vice presidents; general managers; vice presidents of manufacturing and/or operations; plant, works or factory managers and superintendents; directors of production engineering; and managers of manufacturing—people with lateral interests and access to the dollars and plans needed to complete our questionnaire. We mail one questionnaire per plant, using a computer program to select the highest title reached on an alphabetical search of each selected plant galley. We conducted the survey July 10, 1989, and cut off the response August 9, 1989.

As of the cut off date, 2,825 surveys were returned (28. 25 percent response rate). 2,677 surveys were determined usable.

casts, the mood is rather upbeat. American companies are awakening to the fact that efficient manufacturing is the key to becoming world competitive.

Three times as many plants plan to increase spending as those looking at cut-backs. More than half of all respondents believe 1990 will see higher operating levels. This positive outlook translates into $10.74 billion of spending on productive equipment—an increase of 8.4 percent over 1989's $9.91 billion. One cautionary note: when compared with 1989, fewer (by percentage) respondents indicated they'd be increasing spending (43.7 vs. 47.5 percent), while more said they'd be decreasing (15.3 vs. 13.4 percent). And inflation accounts for 5 percent of that 1990 gain.

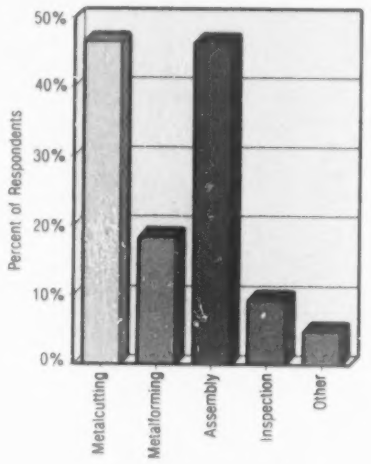
Why spend? As always, the desire to reduce direct labor is the leading reason (66.6 percent as compared with scrap rework, 24.3 percentage points lower at 42.3 percent) to purchase capital equipment. As discussed below, assembly operations—which apparently have a higher manual content than metalcutting and forming—appear to be the target here. But in recent years three trends have emerged as motives increasing for capital spending: (1) the pressure to improve quality, (2) push for reduced in-process inventory and (3) the need to eliminate scrap and rework.

Nearly half ($5.1 billion) of the total dollars to purchase equipment will go toward machine tools. About $3.8 billion worth of metalcutting machines will be sold next year. Of that, one-third ($1.2 billion) will go to purchase machining centers and one-quarter ($912 million) will be turning equipment. The next largest category of total equipment spending falls into the assembly area ($1.7 billion).

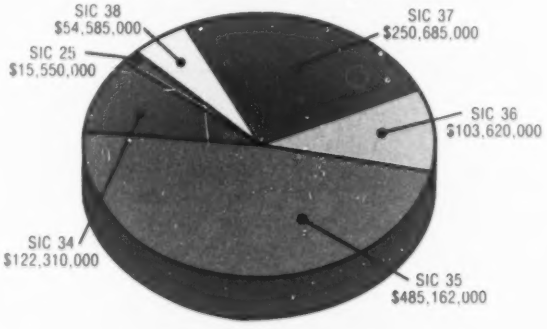
According to respondents, 73 percent of all equipment purchased will be sourced by a domestic supplier, an increase of 1 percent from the year earlier. When a company is planning to purchase equipment from an offshore supplier (and the number, 18 percent, is even with 1989) the rea-

CELLS

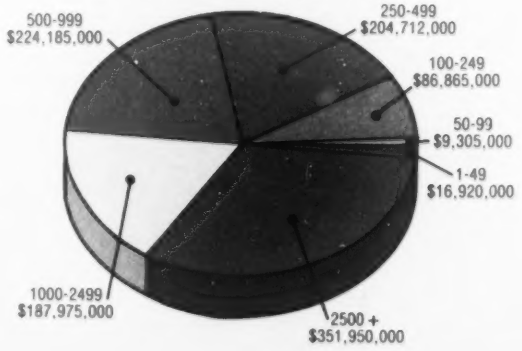
If you plan to purchase cells, the cell's primary function will be...?



Dollar Volume By 2-Digit SIC

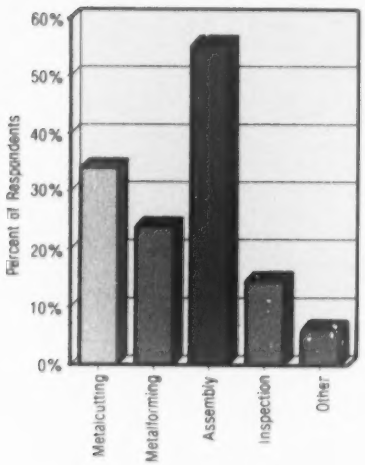


Dollar Volume By Plant Size



FMS

If you plan to purchase an FMS, the system's primary function will be...?



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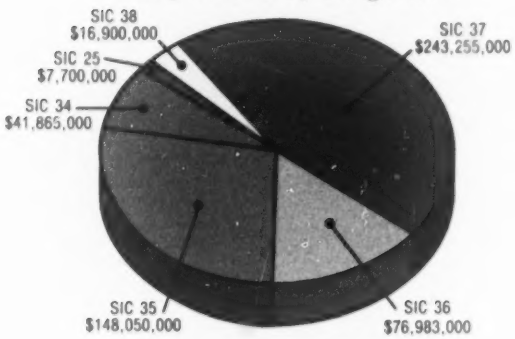
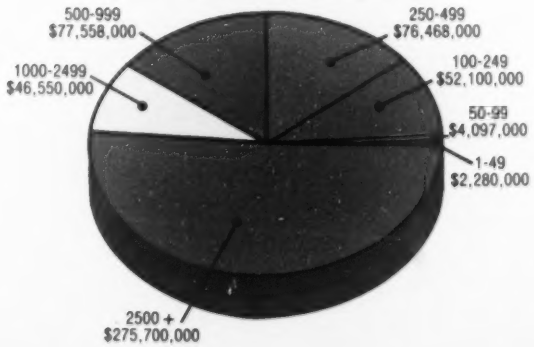


Dollar Volume By Plant Size



sons, in order of importance, are: equipment quality, features and then price.

FMSs vs. cells*. Of particular interest are the buying plans related to the more advanced manufacturing concepts of cells and flexible manufacturing systems (FMSs). Respondents told us that over the next two years they will spend twice as much on cells as systems: $1,081,000,000 vs. $534,750,000. (When does a cell become a system? Ask 10 people, get 10 definitions. See the footnote for ours).

Assembly is cited as the primary function of 46 percent of cells to be purchased and 55 percent of FMS purchases. If, as we think, there's a lot of handwork remaining in the nation's assembly operations, clearly manufacturers are going after direct labor through flexible automation. Interestingly, adding the numbers for FMS metalcutting (33.9 percent) and metalforming (23.8 percent) gives a sum just 2.5 percent above the number of planned assembly FMSs.

Cells will enjoy significant penetration into all but the very smallest plants. FMSs, on the other hand, will remain large plant oriented with more than half of the systems going into plants with more than 2,500 employees. However, both cells and systems will find most use in plants employing 500 or more.

If you would like to receive a copy of the results of PRODUCTION's 1990 Capital Spending Survey, please circle 250 on the reader service card.

**A manufacturing cell is defined as one materials handling device servicing multiple machines which are coordinated and paced by a computer or programmable controller.*

A flexible manufacturing system (FMS) is defined as multiple materials handling devices servicing multiple machines with a computer responsible for coordinating, pacing and scheduling.

SEPTEMBER 1990

PRODUCTION

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Heald's **Seymour**

Minster's **Winch**

DEA's **Curcuru**

Bosch's **Schaefer**

LeBlond's **Bowers**

G&L's **Fife**

Okuma's **Hendrick**

NMTBA's **Moore**

IMTS90

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SEPTEMBER 1990 THE MAGAZINE OF MANUFACTURING MANAGEMENT VOL. 102 NO. 9

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The world of manufacturing technology

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Why they came, where they went, what they saw, and such like—plus, how a French screw machine manufacturer is trying to change the way Europe—and the rest of us—thinks.

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Everyone knows that it's a Darwinian struggle out there, survival of the fittest and all that. And comments about cooperation can be disconcerting. Richard Dove is making them, nevertheless.

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UPDATE

'Have a Good Day'

Remember biorhythms? There is a company in England—The London Biorhythm Company—that has developed a handbag-size mathematical device that can establish the peaks and valleys in a person's bio's, which are widely believed to affect performance both positively and adversely. And, apparently with this knowledge, a degree of control over the likelihood of accidents can be gained.

The Bio-Display Unit is designed to give an accurate picture of a person's emotional, physical and intellectual well-being. Observations over many years show that these follow regular cycles of 23, 28 and 33 days respectively. The peaks and valleys of biorhythms are presented as three sine curves marking the relevant days and weeks. The central line about which they oscillate is termed the 'caution' or 'critical' line. It is when each cycle crosses this line—from negative to positive or vice versa—that physical, emotional or intellectual mistakes are most likely to happen.

Japan takes biorhythms seriously. Research conducted by the police force in Tokyo demonstrated that 82 percent of motor accidents occurred on critical biorhythm days, as did 82 percent of run traffic light offenses. More than 5,000 companies in Japan use biorhythm predictions to limit accident rates in factories.

Further research indicates the unexpected effect that a combination of three high points in a person's bio curves does not necessarily result in peak performance: Such a conjuncture can lead to overconfidence and carelessness. The best combination for most activities appears to be a combination of two high points with one low one.

*For more information on the Bio-Display Unit, circle **284** on the reader service card.*

Middle Market Merging: It's a Deal

"When selling a privately-held mid-size business, we counsel the business owner to remember that there are three parties to every transaction—the seller, the buyer, and the Internal Revenue Service."

That from David R. Hoods, division president of The Geneva Companies, Irvine, CA-based specialists in middle market mergers and acquisitions.

More than ever, deal structure creativity is the single most important element in successfully closing these transactions, and Hoods says preservation of after-tax wealth is a key element. "It's not uncommon to see money loaned to the seller's business using the seller's stock as collateral included in the deal structure of a 1990 middle market merger and acquisition. Middle market business sellers are also being encouraged to participate in the future of the business as consultants or part-time managers as another deal structuring technique."

Hoods says that the deal structuring strategy is welcomed by both seller and buyer in that the seller is able to defer a portion of the taxes on the sale and it helps the seller make a leisurely transition from running the business full-time. The buyer benefits by deferring a portion of the purchase price, and having the seller as continuity helps reduce the buyer's learning time.

Unlike the huge hostile takeovers that make the headlines, these middle market deals, says Hoods, typically have a seller who is now ready to sell. "When asked why they are considering the sale of their business, the most frequently given reason by the typical seller continues to be boredom or burnout." Not to mention that large U.S. and foreign corporations are scouting for strategic acquisitions of middle market businesses to enhance their own businesses. It's a favorable selling climate.

R&D: Short-term Survival, Long-term Jeopardy

The top 100 spenders on research and development among U.S. corporations did not increase their R&D funding as much in 1989 as in 1988. The recently issued annual survey by Inside R&D®, the weekly intelligence service for corporate executives, reveals that R&D spending for the 100 increased 8.7 percent in 1989, compared with a gain of 10.7 percent in 1988.

Still, the research-minded top 100 did considerably better than U.S. companies in general which the National Science Foundation says boosted spending only four percent. Charles Joslin, Inside R&D® editor, says the slowdown, which had been seen in other companies since the mid-1980s, is now seeping up into the top 100.

Joslin blames a new emphasis by the big spenders on pursuing incremental product improvements, in imitation of the Japanese, instead of pushing more basic research toward big breakthroughs. Companies are less likely to fund speculative research that might lead them outside present product lines. This strategy and other research economies are pursued by managers anxious to hold down costs. Goals are short term: Keep company stock out of reach of corporate raiders.

For more information, contact Charles Joslin, Inside R&D®, P.O. Box 1304, Fort Lee, NJ 07024-9967; telephone 201-568-4744; FAX 201-568-8247.

Industry (number of companies included)	1989	1988	% Increase
Computers (15)	11,510.4	9,840.5	17.0
Motor vehicles (4)	9,491.8	8,664.5	9.5
Pharmaceuticals (13)	5,688.4	5,068.6	12.3
Electronics (15)	5,280.0	4,779.7	10.5
Aerospace (10)	4,729.4	4,656.5	1.6
Chemicals (9)	4,127.7	3,849.7	7.2
Scientific and photographic equipment (6)	3,917.6	3,264.8	20.0
Telecommunications (2)	2,933.0	2,869.0	2.2
Petroleum (8)	2,055.0	1,918.0	7.1
Industrial and farm equipment (4)	694.0	597.9	16.1

Source: Inside R&D®